A C T A P A R A S I T O L O G I C A P O L O N I C A
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Semitrichodina convexa sp. n. (*Urceolariidae*) from land snail *Cochlodina laminata* (M o n t.)

Semitrichodina convexa sp. n. (*Urceolariidae*) ze ślimaka lądowego *Cochlodina laminata* (M o n t.)

While examining land snails from the environs of Sanok, S. E. Poland, in the spring 1960, the present author confirmed the occurrence of a new parasitic ciliate species of the genus *Semitrichodina* K a z u b s k i 1958 living in *Cochlodina laminata* (M o n t.) of the family *Clausiliidae*. The present writer named this ciliate *S. convexa* sp. n. owing to the saliant body shape at the adoral side of this species.

The ciliates were found in two snails (of a total of twelve investigated ones) as were collected on the trunks in an oak-hornbeam (*Querceto — Carpinetum*) wood on the hill slopes, near Sanok on the right bank of the San river. The station was at a level of some 350 m. over sea level.

The ciliates parasitized in the mantle cavity. Infection intensity was not high, a few specimens only being found in one host.

The parasites were examined in vivo with utilization of phase contrast and Ag impregnated preparations after Klein.

Description of *Semitrichodina convexa* sp. n. *Urceolariidae* with circular body shape, very saliant at the adoral side. Slightly asymmetric owing to the apex being somewhat shifted towards the commencement of the adoral spiral. The living specimens attain 56 μ in height, and 65 μ in diameter.

The adoral spiral of cilia forms approximately 0.5 turn, and, measured after L o m's 1956 methods, corresponds more or less to an arch with a central angle 160 to 180°. Advancing towards the infundibulum, the spiral approaches the centre of the body.

The adhesive apparatus structure is typical of the genus. The diameter of the adhesive disc is 32 to 47 μ, and that of the denticulate ring is 17 to 24 μ. The links of the denticulate ring number 22 to 25 (they numbered 25 in 4 of the 5 specimens examined). The denticle is 9 to 12 μ in length, 6.1 to 6.4 μ in width, the length of the centripetal spike 3.5 to 3.8 μ, the length of the central part of the denticle 1.9 to 2.2 μ while the centrifugal hook is 6.1 to 6.4 μ long. The centrifugal hook is crescent-like bent being the widest in the middle of its length. There are 7 or 8 striae of the striated band per denticle.

The cilia of the ciliary girdle are some 12 μ in length.

The ovoid macronucleus measures 14 to 16.5 μ × 9 to 14 μ. In the preparations available, the micronucleus was not visible. It probably was situated just by the macronucleus, the same as in *S. sphaeronuclea*.

The present author has ranged this species within the genus *Semitrichodina* Kazubski 1958 on the grounds of the structure of its adoral ciliary spiral, and of that of the denticulate ring as well as because of the shape of the macronucleus, and owing to this species parasitizing on terrestrial *Gastropoda*. Only one species belonged to this genus, *S. sphaeronuclea* (Lom 1956) Kazubski 1958, which was described so far on two occasions: (1) by Lom 1956, who confirmed the following data: 26 to 31 links of denticulate ring (28 on the average); host: *Limax maximus* L., and *Bielzia coerulans* (Bielz) of *Limacidae*; (2) by Kazubski 1958: 31 to 35 links of denticulate ring (33 on the average); host: *Oxychilus* (*Schistophallus*) *orientalis* (Cless.) of *Zonitidae*. This species was also noted (Kazubski 1960) in the snails *Semilimax semilimax* (Fèr.) of *Vitrinidae*, and in *Aegopinella epipedostoma* (Fagot) of *Zonitidae*; however, no descriptions of these forms were published.

Semitrichodina convexa sp.n. differs from *S. sphaeronuclea* (Lom) first of all in the body shape and its height. The body of *S. convexa* sp.n. is more saliant and more dome-shaped, the height almost equalling the width, while *S. sphaeronuclea* is flattened, its diameter being almost two times its height and the margins being slightly notched. The adoral spiral is somewhat longer in *S. convexa* forming a 160° to 180° arch, while it is 110° in *S. sphaeronuclea*, after Lom 1956. The silver impregnated preparations have shown that the adoral spiral sets in, in *S. convexa*, not at the very margin of the body — like in *S. sphaeronuclea*, but somewhat nearer towards the apex. This is indicative of the adoral spiral setting in and running above the widest body circumference of the ciliate. The macronucleus too differs in shape and dimensions. It is larger in *S. convexa* measuring 14 to 16.5 μ × 9 to 14 μ, the ovoid shape being more typical, while in *S. sphaeronuclea* it reaches the maximum size of 15 μ (Lom 1956) on some occasions only.

The denticulate ring diameter is rather similar in both species, the number of the links, however, being different: 22 to 25 in *S. convexa*, and 26 to 35 in *S. sphaeronuclea*.

These figures could be indicative of some differences; still, similar or even somewhat more considerable differences in the number of denticles occur within the sole species *S. sphaeronuclea* between the "forms" from *Limax maximus* and *Bielzia coerulans* with 26 to 31 denticles (28 on the average), and in *Oxychilus* (*Schistophallus*) *orientalis* with 31 to 35 (33 on the average). Both of these *S. sphaeronuclea* "forms" may occur parallely in the same area, e.g. in the Carpathians in S. E. Poland. However, both of these "forms" should still be regarded as belonging to one species; at least until further investigations are carried out that would prove the presence of some other, more essential, differences. The differences in the structure of the denticular ring of *S. convexa* and *S. sphaeronuclea*, do not consist in the number of links only. The denticles of *S. convexa* are significantly narrower than those of *S. sphaeronuclea* and their centripetal spikes are located opposite the hook of their own denticle (remaining within the same radius) or, more backwards,

opposite the interval between the hook of their own denticle and the next one in the direction oposite to the rotary movement of the ciliate.

In *S. sphaeronuclea,* on the contrary, the spike is situated within the radius of the interval between the second and the third hook. Besides, in both of these species the centrifugal hooks differ considerably in shape. In *S. convexa* they are bent like the crescent, while in *S. sphaeronuclea* the part of the hook as runs rightwards is narrow turning then sharply to the left forming a significantly wider spatular part.

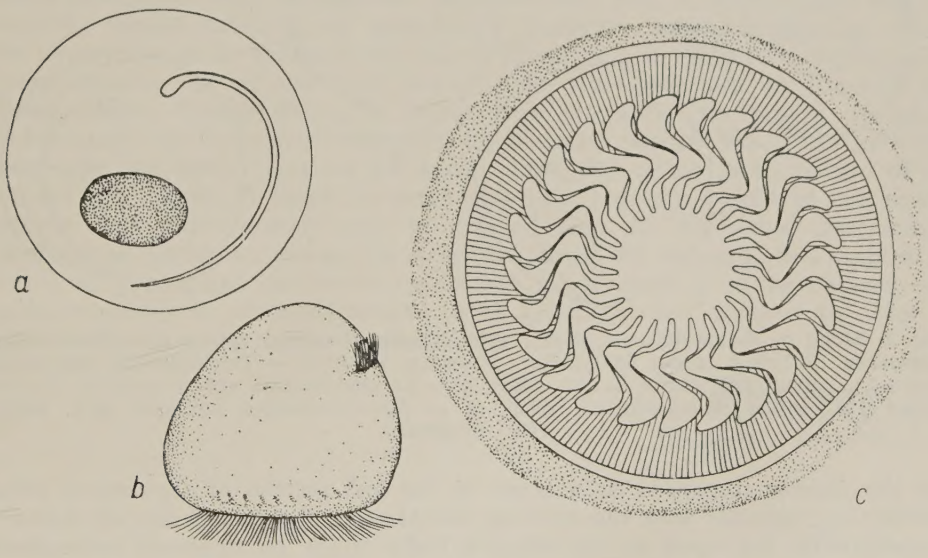

Fig. 1. *Semitrichodina convexa* sp.n. a — lateral view; b — adoral side; c — adhesive disc

The differences reported here seem to prove sufficiently the specific distinction of the ciliates parasitizing in *Cochlodina laminata,* and justify the creation of a new species to cover them, as well as the species created to be ranged within the genus *Semitrichodina* Kazubski 1958.

In connection with the present paper, the author wishes to make some remarks concerning the relatively important question of the genus *Semitrichodina* taxonomy, namely: on the measuring the length of adoral spiral. This measurement represents no difficulty in other *Urceolariidae.* In *Trichodina* Ehrenberg 1838, this spiral makes one turn (or slightly more than one), almost parallel to the body margin. Similar is the situation with the genus *Trichodinella* Šramek-Hušek 1953: although the spiral is shorter and makes less than one turn, it still runs parallelly to the body margin, the measurement of its length in degrees of the central angle with the centre of the ciliate representing no difficulty whatsoever.

The problem becomes more complicated in the case of the species of the genus *Semitrichodina* Kazubski 1958. The adoral spiral of cilia is short and runs towards the centre of the body, i.e. it is not parallel to the body mar-

gin. The apex of the body seems slightly shifted towards the commencement of the adoral zone (it does not seem, it is, in *S. convexa*). This would keep in line with the observations reported by J. Raabe and Z. Raabe 1961 who pointed to the fact that in *S. sphaeronuclea* silver would be absorbed

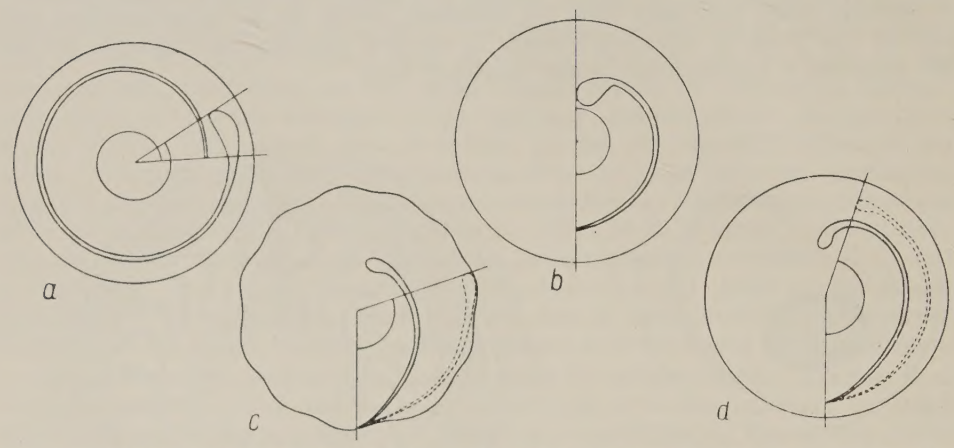

Fig. 2. Mode of measurements of the arch length of adoral spiral. a — *Trichodina pediculus* Ehrbg. about 400° (after Raabe 1950); b — *Trichodinella epizootica* (Raabe) about 180° (after Lom 1956); c — *Semitrichodina sphaeronuclea* (Lom) about 110° (after Kazubski 1958); d — *Semitrichodina convexa* sp.n. about 160° (original)

by the furrow (regarded as a trace of the lost section of the adoral zone) delimiting, together with the existing adoral zone, the "small cap sat askew"; consequently the apex of the ciliate's body might be expected somewhere near the centre of the "small cap". Besides, in *S. sphaeronuclea*, the adoral spiral sets in at the margin of the silver impregnated body while it sets in somewhat further from the margin and closer to the centre in *S. convexa*. The question thus arises how the length of the spiral ought to be measured so as to obtain the best comparable data.

Lom 1956 measured the adoral ciliary spiral of *S. sphaeronuclea* as if it were near the body margin, and obtained a central angle of some 110°. Kazubski 1958 measured the angle formed by the radii running from the body centre towards the ends of the adoral spiral obtaining an angle of some 180°. The latter method, however, is not appropriate for: (1) very inaccurate results are obtained when short, markedly centripetal spirals are thus being measured; (2) the body centre does not necessarily correspond to the apex of the ciliate's body (epecially not in the Ag impregnated preparations).

Defining the length of the adoral spiral by means of the central angles formed by the radii running from the ciliate's apex towards the ends of the spiral would seem the most correct. However, the above method can not be applied in practice owing to the obstacles and to the lack of accuracy in defining the location of such apex, especially so in the Ag impregnated preparations after Klein generally utilized in *Urceolariidae* taxonomy. True,

mathematic methods could be applied in seeking the centre of the spiral formed by the adoral zone (simple adding so as to form a whole circle is not correct) and the sector defined as is formed by the ciliary spiral. However, this is complicated and, besides, the data obtained could be wrong because of deformations resulting from the drying of the ciliates before Ag impregnation.

Consequently, the best method for adoral spiral measuring of the length of the adoral spiral is as proposed by Lom 1956, i. e. by measuring the central angle from the body centre as if the adoral spiral were near the body margin (in Ag impregnated preparations). This is the simplest method and the results obtained are comparable. However, some modification would be necessary. In *S. convexa* the adoral spiral sets in (in silver impregnated preparations) not at the body margin but somewhat further towards the body centre. Consequently, it seems that the arch, the length of which corresponds to the section measured, ought to be constructed so that it might run from the initial point of the spiral, parallelly to the body margin of the ciliate. Of course, it must be emphasized that measurements of the adoral spiral after this method may be utilized only for biometric comparisons within the limits of the genus *Semitrichodina*. To be sure, the number of turns of the spiral (or better: measured in degrees) is to be defined and good drawings or photographs are to be given on each occasion in order to give comprehensive characteristics of the ciliate.

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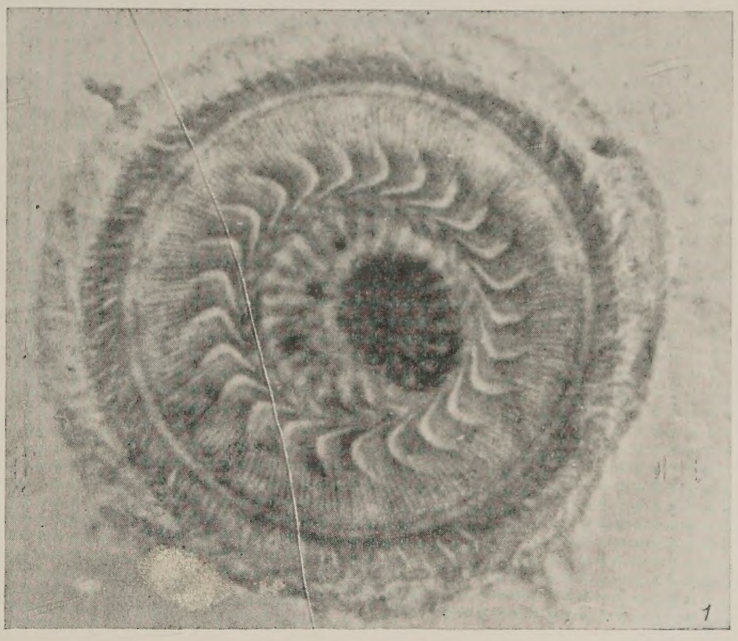
STRESZCZENIE

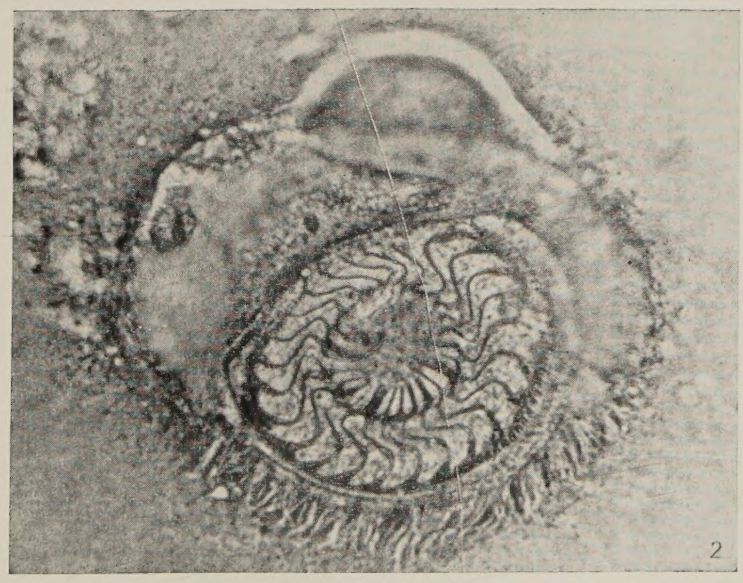
Opisano nowy gatunek pasożytniczego orzęska *Semitrichodina convexa* sp.n. (*Urceolariidae*), występującego u ślimaków lądowych *Cochlodina laminata* (Mont.) — *Clausiliidae* i przeprowadzono szczegółowe porównanie tego gatunku z *S. sphaeronuclea* (Lom).

Autor analizuje następnie sposoby mierzenia spirali adoralnej i dochodzi do wniosku, że najbardziej dogodny jest sposób pomiaru, proponowany przez Lom'a (1956) z niewielką modyfikacją.

EXPLANATION OF PLATE I

Phot. 1. *Semitrichodina convexa* sp. n., contrast phase.
Phot. 2. *Semitrichodina convexa* sp. n., $AgNO_3$.





S. L. Kazubski auctor phot.